

Hussey (3.)
BRIEF INSTRUCTIONS

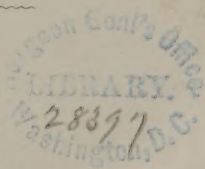
IN THE USE OF

THE PERFECT ADJUSTER:

BY

ZIMRI HUSSEY, M. D.

Engravings by N. H. Taylor, Chillicothe, Ohio.



CINCINNATI:

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ZIMRI HUSSEY, M. D.,
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HUSSEY'S PERFECT ADJUSTER.

No instrument, however perfect its adaptation to the end proposed, can supply the place of skill in the one who handles it; therefore, in presenting to the surgeon the "PERFECT ADJUSTER," the inventor does not propose to supersede the necessity for judgment and tact in its application; but he does intend to furnish a complete apparatus to aid the operator in the accomplishment of important purposes.

ADDRESS.

THE undersigned would respectfully say to the surgeon, that, having spent much labor and pains to bring his Adjuster to a state of comparative perfection, he now presents it for the test of approval.

A careful examination of contrivances heretofore employed for the purpose of effecting extension and counter-extension, and for preserving coaptation of parts in the treatment of fractured bones, and also for reducing luxations of joints consequent to the extremities of the human body, inspires the writer with confidence in presenting his apparatus for thorough disquisition.

The present edition of "Instructions" is not offered as a treatise on surgery, but is merely intended to illustrate the applications of the Adjuster, in the hands of persons conversant with this branch of practice. In order to present these various applications at once to the comprehension, a number of wood cuts are introduced, accompanied with references and brief explanations.

Without speaking disparagingly of other apparatus in use, or pretending to have discovered new principles in surgery, the inventor offers his Adjuster as one possessing a happy combination of mechanical principles, carefully adapted to the purposes it is intended to fulfill.

FIRST. As an efficient extending and counter-extending power, applied in a direct line with the shaft of the bone.

SECOND. With the extension may be made rapidly or slowly—may be retained, or remitted gradually or immediately.

THIRD. While extension is being effected, the limb may be moved in any direction necessary to aid in reducing a luxation.

FOURTH. It furnishes ample facilities for preserving the points of extension and counter-extension precisely at the desired limits, and of maintaining, undisturbed, the coaptation of parts.

FIFTH. It is so constructed that either half of the double-inclined plane is a complete Adjuster for the part to which it is applicable—the upper half to fractures of the shaft of the femur, and the lower half to fractures below the knee.

SIXTH. It is constructed with special reference to the *successful treatment of all cases of fractures and dislocations* requiring extension and counter-extension; and for effectually preserving the contact and correct position of parts in *all* fractured bones in connection with the lower extremities.

An apparatus capable of exerting an extending force equal to almost any emergency, combining in itself a well adjusted and equal counter-extending fixture—with movements "gentle, continued and directed by the surgeon's mind"—can not fail to commend itself to an intelligent profession. And when we duly consider the fact, that "it is now generally agreed, among the most eminent surgeons, that force should be only gradually applied," we will be likely to draw the conclusion, that the "sudden, violent, and often ill-directed efforts of assistants," should, as far as possible, be dispensed with. "For sudden violence is as likely to tear sound parts as to reduce those which are dislocated; and it is apt to excite all the powers of resistance in opposition to the efforts of the surgeon." (See Cooper on Dislocations and Fractures, p. 67.)

Another peculiarity of this apparatus is, that it is furnished with metallic bands for the purpose of being passed around near the ends of the splints, and securing them upon the limbs in cases of fractures of the long bones. These splints being covered, are placed directly upon the limb—two, three or four in number—and fastened by these bands at any required degree of tightness. This leaves the limb accessible to constant inspection of its condition, and affords opportunity for necessary attention to flesh wounds and contusions, in cases where they occur. These privileges are allowed without any disturbance to the apposition of fractured bones, or derangement of the limb, in any way—the splints being secure in their places, and extension and counter-extension maintained. The importance of these advantages will be at once obvious to the experienced surgeon.

The Perfect Adjuster is manufactured under my own supervision, by Mr. Henry Knapp, of Chilli-
cothe, O.—a practical mechanic of no ordinary skill and experience—and will be furnished to the
profession, and other persons interested in its distribution, on reasonable terms and in the best style.

Chillicothe, O., June 16th, 1854.

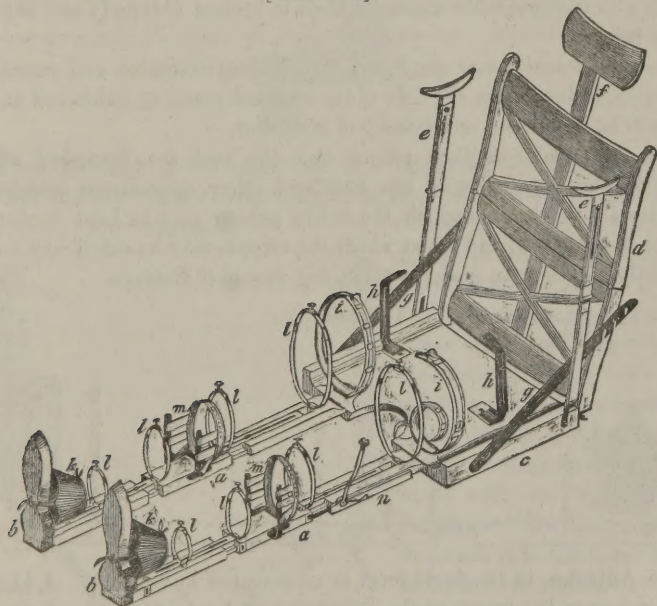
Z. HUSSEY, M. D.

THE PERFECT ADJUSTER.

EXPLAINED AND ILLUSTRATED BY ENGRAVINGS.

Two methods of putting up the Adjuster, for sale, have been adopted, as represented in the figures 1 and 2. The first (fig. 1) is constituted of two double-inclined planes, *a, a*, with movable foot pieces attached, *b, b*; the inclined planes are connected at their upper ends with a seat piece, *c*, with a back, *d*, supported at any degree of inclination by braces,

[FIGURE I.]



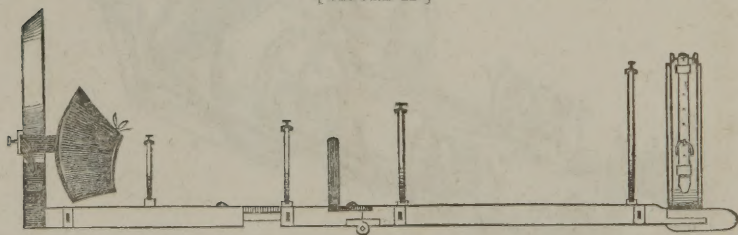
g, g, and a rest for the head, *f*. Crutches, *e, e*, are attached to the sides of the seat, capable of being lengthened, shortened or removed, at pleasure. Two semi-circular metallic braces, *i, i*, for inclosing the hips, are placed upon the seat piece, near the front edge, secured by bolts passing through it and the upper ends of the inclined planes. These braces can be made fast at a greater or less distance apart—are concave on their outer faces for the purpose of receiving straps, that inclose each

a limb at the groin. These straps are clothed with pads that rest upon the perinæum, and, with the braces they include, constitute the principal counter-extending part of the apparatus. For the purpose of effecting extension of the limbs, a kind of shoe, *k, k*, incloses each foot at the ankle, and is laced upon the instep. These are attached to the foot pieces by straps secured around them. There are also bands, *m, m*, for effecting extension at the knees. They are buckled around the limbs just above the knee joints, and are furnished with loops that inclose the horns of the *knee fork*, more fully described hereafter. The metallic bands, *l, l, l, l, l, l, l, l*, for securing splints upon the limbs, are passed through loops upon the double-inclined planes, and fastened, at any required length, by sliding loops and screws. Two braces, *h, h*, are attached to the seat, each one adjustable to the *os ilium* immediately below its crest, effectually to prevent rotating of the pelvis. This precaution should never be neglected in cases of fracture of the neck of the femur, and is also indispensable where its shaft is broken obliquely and extensively injured.

The *mechanical power* employed for effecting extension and counter-extension, is fixed upon the side of the inclined plane, as exhibited at *n*, and will be illustrated and described hereafter.

The two double-inclined planes and the seat are furnished with cushions, and, together with the back and other appendages attached, constitute a couch upon which the entire person may be kept *perfectly in line*, if necessary, and upon which the cripple may be safely and conveniently moved from place to place, any required distance.

[FIGURE II.]

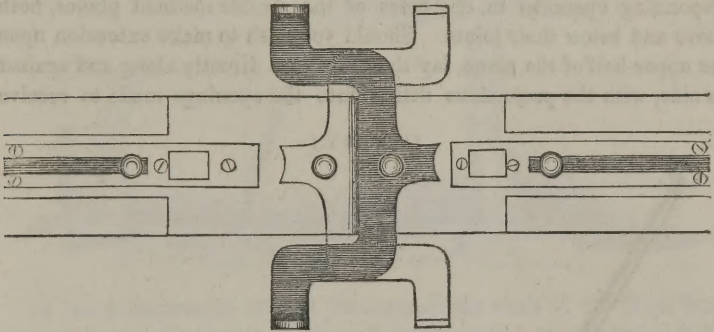


The Adjuster, in its single form, is represented by figure 2. A block is placed upon the tenon, at the upper end of the double-inclined plane, to fit it for receiving the hip brace, strap and pad, for counter-extension. The knee fork is adjusted to its place, and the shoe secured to the foot piece. The bands for inclosing the splints are also exhibited. The hip brace and appendages for counter-extension are alike secure, fastened right or left upon the inclined plane; making it applicable alike to the adjustment of any limb.

The double-inclined plane is securely hinged together at the knee. Each half is made of parts that slide upon each other, and are secured by a bolt and screw at any desired point of extension—the *extending power* being applicable alike to both the upper and lower half.

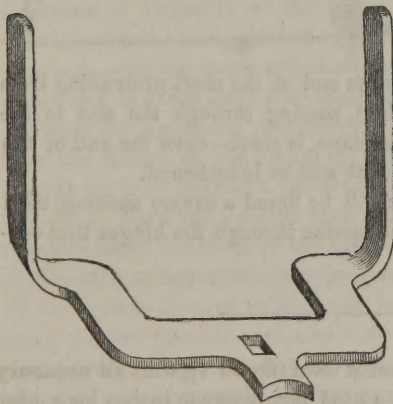
The middle portion of the plane is exhibited by figure 3, illustrating the attachment of the knee fork, and the manner (by dotted lines) of changing it from one to the other half of the double-inclined plane.

[FIGURE III.]



When fastened to the upper half, it is employed to effect extension—when attached to the lower half, to secure a point of counter-extension.

[FIGURE IV.]



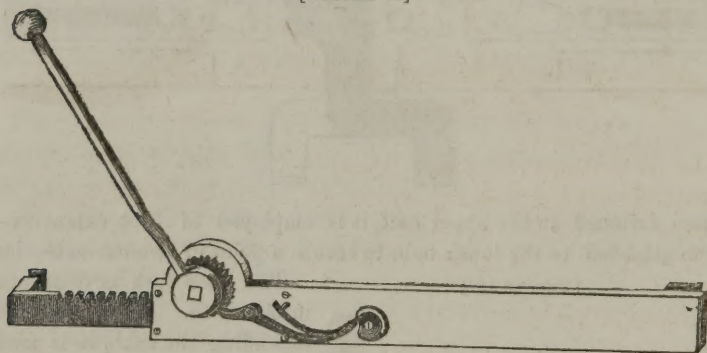
The knee fork is delineated in figure 4. When used for extending the limb, it is made fast by bolt and screw, upon the lower end of the upper half of the plane, just above the joint; the base of the horns presenting in the direction of the foot, and the horns themselves at a right-angle with the upper side of the plane. The change, in order to attach it to the lower half of the plane, is sufficiently represented in figure 3, and the manner in which it is made available,

in effecting extension and counter-extension, is fully presented in the following pages.

The *mechanical power* employed in accomplishing the work of extension is shown in figure 5, and called, in familiar language, the *jack*. It consists of a brass box, half an inch thick, near an inch wide and nine

and a half inches long. Near the left end of this box or case is a semi-circular projection containing a pinion-wheel, with teeth matching those in an iron rack bar—the latter running the entire length of the case. The shaft of the pinion-wheel projects without the case on one side, and holds upon it a ratchet-wheel, into the teeth of which the point of a catch is made to drop by the pressure of a spring. From the right hand end of the box, and the left end of the rack bar, square projections will be found three-eighths of an inch long. These projections fit into corresponding openings in the sides of the double-inclined planes, both above and below their joints. Should you wish to make extension upon the upper half of the plane, lay the brass case directly along and against its side, with the projections fitting into the openings made to receive

[FIGURE V.]



them; place the lever upon the square end of the shaft protruding from the ratchet-wheel—see that the bolt passing through the slot in the *movable* portion of this half of the plane is slack—turn the end of the lever round to the right, and the plane will be lengthened.

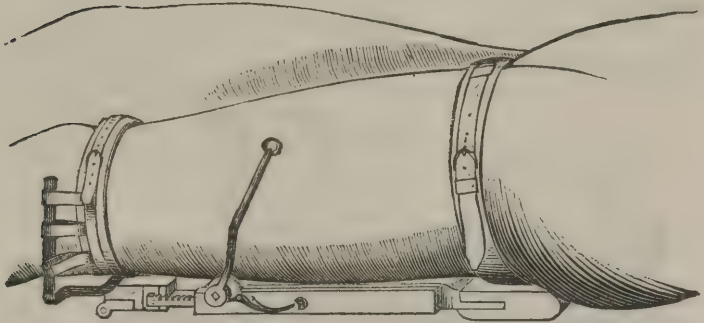
In the bulbous end of the lever will be found a square opening, used for unscrewing the head of the pin passing through the hinges that connect the two halves of the plane.

The Perfect Adjuster, in its double form (figure 1), with all necessary appendages, is securely packed in a neat box, nineteen inches long, nine and a half inches wide and fifteen inches deep, and weighs, including box, thirty-four pounds. The Adjuster in the single form (figure 2), with the *extending power*, cushions, straps and all the fixtures belonging, is furnished in a box seventeen inches long, nine and a half inches wide, and less than four inches thick; all weighing twelve pounds.

APPLICATIONS OF THE PERFECT ADJUSTER.

ILLUSTRATED BY ENGRAVINGS.

[FIGURE VI.]



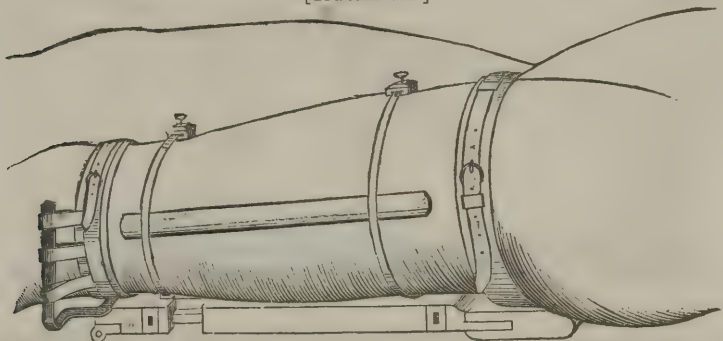
IN the treatment of oblique fractures of the shaft of the thigh bone, great difficulty has been experienced in preventing shortening and distortion of the limb.

The engraving above (figure 6) illustrates the application of the Adjuster for the purpose of effecting extension and counter-extension in the treatment of fractures of the femur. Remove the lower half of the double-inclined plane, place the upper half directly along and beneath the thigh—the hip brace and block being previously made fast upon the upper end, and the knee fork secured in its place—bring the strap up and over the perinæum (the pad being properly adjusted upon it), fasten it on the button at the top of the brace, and buckle it on the outside. Buckle the knee strap and pad around the knee, just above the swell of the joint; place two loops on each side, that come nearest the center of the limb, upon the horns of the knee fork; adjust the *jack* upon the side of the plane, as indicated in the foregoing cut, and turn the lever steadily till the limb is restored to its proper length. Now, take the wrench provided for the purpose, and screw the brass tap beneath upon the bolt that passes through the slot in the center of the sliding portion of the plane, till the parts are made fast together—when the *jack* may be removed. In some cases of transverse, or nearly transverse, fracture of the bone, it may be well for the surgeon, during the process of extension, to maintain, with his hand, the bone in a bent position, in the direction to which it is inclined, and extend steadily till the ends of the fragments mount upon each other, when their complete apposition should

be established, the limb straightened and done up as represented in figure 7.

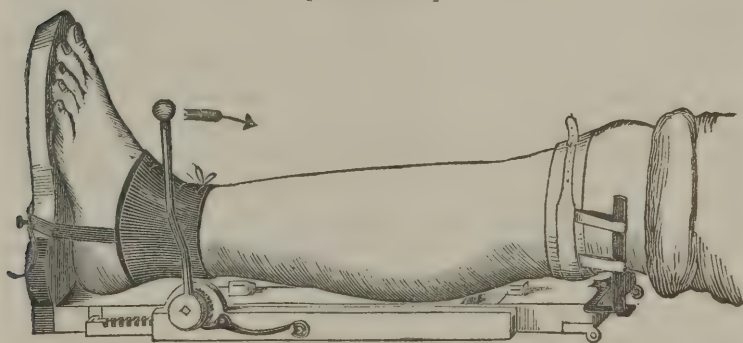
As many splints as the surgeon may think necessary should be applied, and secured as here represented. A roller bandage may also be used in all cases where it is thought advisable, either with or without the metallic bands. The special object of their employment has been mentioned heretofore.

[FIGURE VII.]



The application of the lower half of the double-inclined plane, for the purpose of accomplishing extension and counter-extension, in cases of fracture below the knee, is well represented in figure 8.

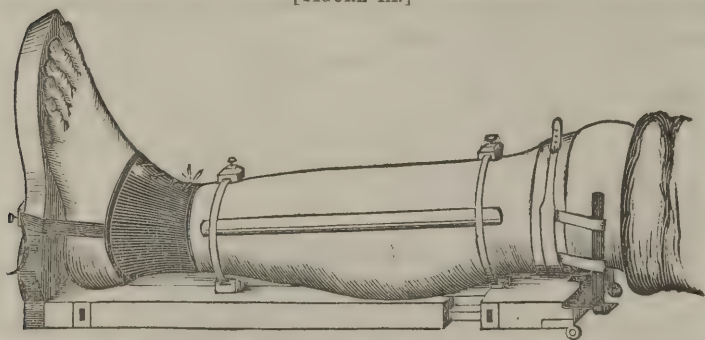
[FIGURE VIII.]



It will be perceived that the knee fork is here fastened upon the upper end of the lower half of the plane, its point of attachment reversed from what it is in the preceding figure, and that, in this place, it is used to effect counter-extension—the padded band being fastened around the limb, and resting against the swell of the knee below the joint, with its loops thrown over the horns of the knee fork, standing upward upon the limb.

To accomplish extension, the broad band or shoe piece is laced around the ankle, its straps passed around the sole or foot piece, and secured by the pressure of a screw; the jack is then adjusted to its place on the side of the plane, and the desired extension effected. This being done, the bolt through the plane is made tight, as before directed, and the extending power removed. It now remains to dress the limb, as indicated by figure 9, or in any other way that may be better adapted to the special case under treatment. The mind of the surgeon should be fruitful in devising expedients, and ready in the application of his knowledge to the difficulties presented to the exercise of his skill.

[FIGURE IX.]



The human extremities include such diversities in figure and general aspect, that the same splint can not be expected to fit the same part of every limb, though of the same length. Some are straight, tapering and symmetrical, with joints smooth and free from protuberances. Others are flattened, bowed and unshapely, with projecting angles about the joints. It will be found to require much more address to apply the Adjuster properly to some limbs than to others. Every fractured limb should be restored to the form of its fellow that has not been injured. And if both are broken, recover their original form as nearly as possible. Attempt to correct nature only in cases of real deformity.

I will here remark, that the method of applying the Adjuster, represented in figure 8, will also apply, with such modifications as the peculiarity of special cases may indicate, to dislocations of the ankle joint. In compound dislocations of this joint, the shoe may be adapted to the condition of the part by removing a portion of the upper half, or by making such holes in it as will give access to the ruptured integuments and ligaments. In order to afford opportunity for passive motion of the joint, let the extension be effected with the straps passing around the foot-piece so lengthened as to leave an open space of an inch be-

tween it and the sole of the foot; have this space filled with a roll of muslin, smoothly folded. When passive motion is desired, this roll should be removed, and the motion of the joint made at the suggestion of the attending surgeon. A soft flannel bandage, or other necessary protection to the skin, is always admissible between the shoe and the ankle.

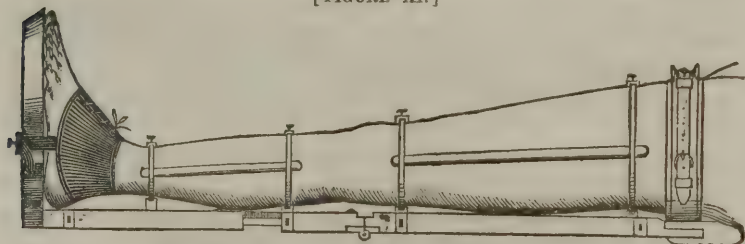
The method of applying the Adjuster to effect extension of the whole limb, applicable to cases of fracture occurring in the leg and thigh at the same time, is represented in figure 10. It will be perceived that the knee fork is not used in this instance, and that counter-extension is secured as in figure 6, and extension effected as in figure 8; only that, in this case, the extending power is applied to the upper half of the plane instead of to the lower. This, however, is a matter of choice, and makes no difference in the result.

[FIGURE X.]



In applying the Adjuster to a limb, lengthen its parts to suit that limb; secure, in their appropriate places, the extending and counter-extending fixtures, tighten the bolt passing through one-half of the plane so that the parts can not slide upon each other, apply the extending power to the other half of the plane and effect the necessary extension, then tighten the bolt through this half of the plane, remove the jack and dress the fractured parts as illustrated in figure 11, with such modifications as may be indispensable in the case being treated.

[FIGURE XI.]



In all important cases presented for investigation or treatment, the latent energies of the surgeon should be stimulated, and his reason and judgment called into exercise, that he may make the instructions fur-

nished by the experience of others a part of his own knowledge, and apply that knowledge to the case before him, that he may be enabled to overcome its difficulties.

The double Adjuster, including the appendages necessary to constitute it a *couch*, with a person in it, is represented by figure 12. The

[FIGURE XII.]



method of effecting extension and counter-extension of the lower limbs, has been illustrated and explained already, and need not here be repeated. In order, however, to exemplify the applicability of the instrument to difficult cases, this cut is introduced—representing a person with his left thigh and right leg broken, and so adjusted upon the apparatus as to allow of his removal from place to place, without danger of disarranging the fractured parts, or retarding the progress of recovery.

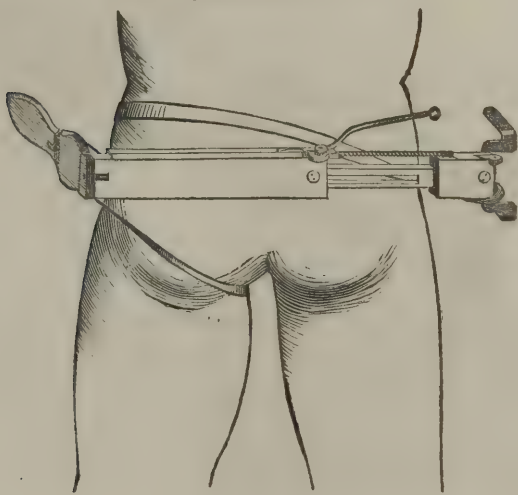
DISLOCATIONS OF THE HIP JOINT.

Before proceeding to illustrate the application of the Adjuster to luxations of the hip joint, I will state that, when any violence is exerted upon the bone of the thigh, adequate to the removal of its head from

the acetabulum, or socket, in which it rotates, it is generally thrown in one of four directions, from the influence of muscles upon the part: First, upward, or upon the dorsum of the ilium; secondly, downward, or into the foramen ovale; thirdly, backward and upward, or into the ischiatic notch; and, fourthly, forward and upward, or upon the body of the pubes.

To effect reduction of the first, where the head of the femur rests upon the dorsum of the ilium—with the patient lying on his back, the knee of the dislocated limb elevated about ten inches, and brought over the other limb (which should lie straight) just above the knee—apply the Adjuster as in figure 6. In this case, however, for the support of the knee and leg, the lower half of the plane may remain in connection with the upper. The extending power should be exerted with considerable force, at intervals, till the muscles become wearied, and the bulb is brought upon the border of the cavity, when, by a little increased extension and rotating of the limb, the bone will rest in its socket.

[FIGURE XIII.]



To reduce the second variety of dislocation of the hip joint, where the head of the femur is thrown downward into the foramen ovale, take the lower half of the double-inclined plane (the foot-piece and knee-fork made secure upon it), place it across the back at the hips, with the toe of the foot forward; take two strong leather straps, an inch or more in width and of sufficient length, pass one of these around the luxated thigh, at the pudendum, and secure it over the waist of the foot-piece;

the other, as a counter-extending force to preserve stationary the pelvis, is passed completely around both ilia, secured upon the lower horn of the knee-fork and rested upon the end of the plane; the extending power is now adjusted on the plane and extension effected. (See figure 13.) The extension should be steady, and accompanied with well-directed manipulation, in order that the parts may be promptly adjusted. During this operation, the patient should recline toward the well side, the head and shoulders being supported.

The means to be employed for reducing the third variety of dislocation of the hip, where the head of the femur is thrown backward and upward into the ischiatic notch, differ but little from those given for the first, where the head of the bone rests upon the dorsum ilii; but, in the latter case, the dislocated limb should be brought across the other, higher up, during the effort to effect reduction. And, as this kind of dislocation is very difficult to reduce, I would advise, in addition to the directions heretofore given for extending the limb, the disconnecting of the lower half of the double-inclined plane, and its application, in this case, precisely as illustrated and described in connection with figure 13, and the employment of the *extending power*, alternately, upon the two halves of the plane: upon the one adjusted to the limb, for extending it—upon the one adjusted, as in figure 13, in order to lift the head of the femur out of the ischiatic notch, and, together with the extension, pass it over the edge of the acetabulum. These directions, strictly followed, with well directed manipulations, can scarcely fail to succeed in any recent case.

[FIGURE XIV.]

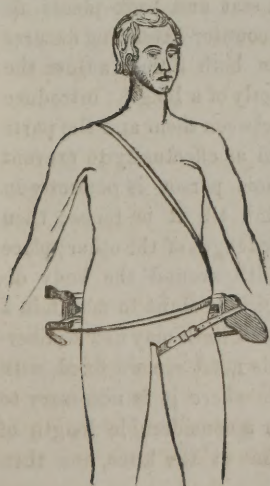


Figure 14 gives a front view of the application of the Adjuster, as represented in figure 13, with the addition of a strap passed over the shoulder, and supporting in its place the extending part.

In the management of the fourth variety of dislocation of the hip joint, forward and upward, or upon the body of the pubes, extension should be made as in figure 6, only, that the knee should be drawn some inches downward, or back of the line of the body. During the process of extension, a towel should be passed under the upper part of the thigh, and, with the left hand steadying the pelvis, and the right grasping both ends of the towel, the head of the bone should be steadily lifted over the pubes and edge of the acetabulum, and restored to its cavity.

In other anomalous dislocations of the head of the femur, the Adjuster is useful for the accomplishment of extension and counter-extension, and should be aided by such manipulations and other assistance as may be essential in the case under treatment.

FRACTURES OF THE NECK OF THE THIGH BONE.

In the treatment of fractures of the cervix femoris, hope of success must depend almost entirely upon perfect apposition of the bones being established and preserved till ossific union has had time to be effected. It is not to be expected that a bony connection will take place in all, or most, cases of fractures of this part, even under the most favorable circumstances. Many reasons are furnished, by surgical writers, for this general failure, evincing a good degree of plausibility. In regard to the probability of effecting a cure, however, there is diversity of opinion.

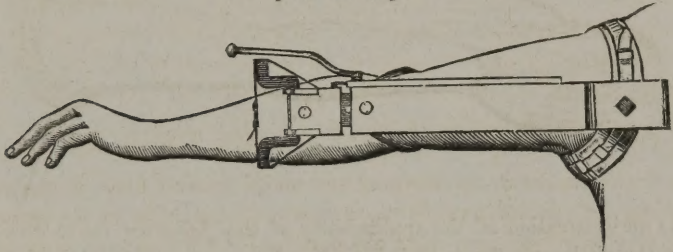
So far as the management of these fractures is concerned, one purpose should be kept steadily in view: to establish ossific union wherever it is possible. To this end, place the patient upon the double Adjuster (figure 1), the two double-inclined planes, the seat and back pieces all lying horizontally. Secure the extending and counter-extending fixtures upon the parts to which they are applied, on both limbs; adjust the crutches in their places, having them both exactly of a length; introduce the braces for the ilia (placing suitable pads between them and the parts against which they rest), and so establish them as effectually to prevent rotating of the pelvis. Now see that the whole person is perfectly in line; apply extension first upon the well limb till it is tense; then extend the fractured limb till it is precisely the length of the other; place a suitable girth or strap, three inches in width, around the body directly over the hip joints, and secure it sufficiently tight to maintain a firm apposition of the fractured bones. The well limb may now be liberated, and the crutches removed; but the pelvis must remain fixed, with extension upon the fractured limb. In cases where it is necessary to continue extension and counter-extension for a considerable length of time, extension may be made a part of the time at the knee, and then changed to the foot.

APPLICATION OF THE ADJUSTER

TO DISLOCATIONS IN CONNECTION WITH THE SUPERIOR EXTREMITIES.

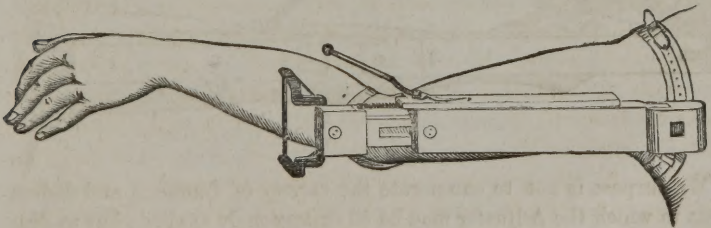
ILLUSTRATED BY ENGRAVINGS.

[FIGURE XV.]



THE application of the Adjuster for reducing luxation of the shoulder joint, is shown in figure 15. Take the upper half of the double-inclined plane, with the block, hip brace and knee fork secured in their places upon it. Lay the plane directly along the back of the arm, with the hip brace passing forward over the shoulder; bring the strap round under the arm (the pad resting against the body) and make it fast upon the brace. This much for counter-extension. Fasten a leather strap—provided for that purpose—around the arm just above the elbow, with a loop furnished for that object, and buckle the ends over the horns of the knee fork; apply the jack, and extend, as indicated. While extension is going on, the arm may be moved freely in any necessary direction. Extension may also be immediately remitted.

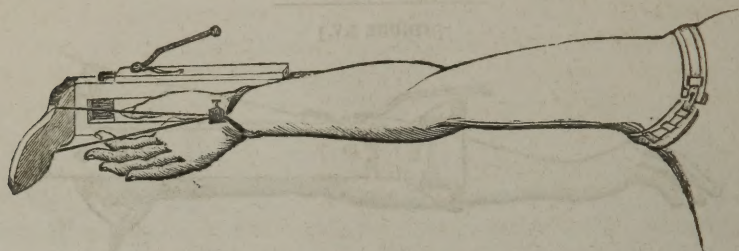
[FIGURE XVI.]



The use of the Adjuster in dislocation of the elbow joint is presented in figure 16. Counter-extension as in figure 15; the point of extension just below the elbow, the arm a little flexed. The illustration is so plain, that a lengthened description is deemed unnecessary. The mode of application for extending the arm at length, is given in figure 17.

The double-inclined plane is here employed entire. The inside of the arm is presented to view. Counter-extension as in the two figures last preceding. Extension at or below the wrist joint. Applicable to dislocation at the wrist, and also to fractures anywhere between the shoulder and wrist joints.

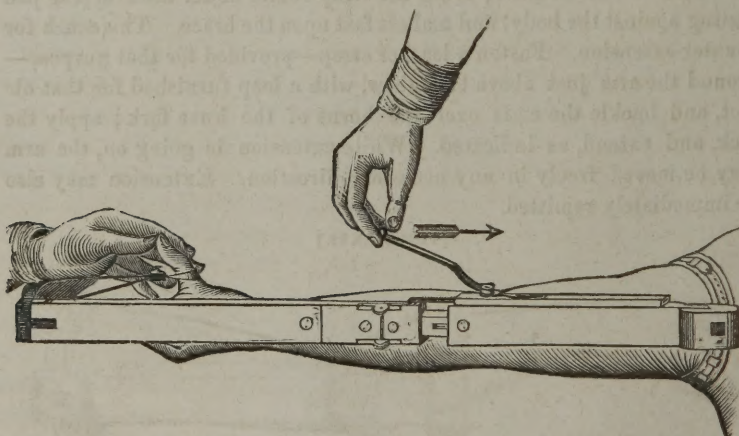
[FIGURE XVII.]



As an illustration of the applicability of the Adjuster for extension upon the phalanges, figure 18 is introduced.

It is not designed, on any occasion, to *continue* the apparatus upon the superior extremities; other appliances being deemed sufficient to maintain the proper position of the parts, when once restored.

[FIGURE XVIII.]



My purpose is not to enumerate the variety of fractures and dislocations to which the Adjuster may be advantageously applied; but to illustrate its adaptation to such a diversity of cases as will enable the skillful surgeon to employ it efficiently in almost any case requiring extension and counter-extension; and effectually to preserve the coaptation of parts in the most difficult cases of fractures. How far this purpose is now accomplished, others will decide.